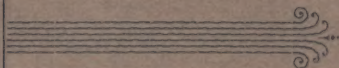
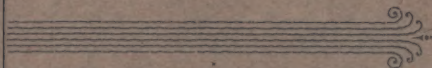


ILLUSTRATED (AN) MANUAL



The Dental Instructor.



COMPLIMENTS OF . . .

THE ISAAC KNAPP DENTAL COTERIE,

FORT WAYNE, INDIANA.



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AN ILLUSTRATED MANUAL
OF
POPULAR
Dental Instruction

BY THE
ISAAC KNAPP DENTAL COTERIE,
FORT WAYNE, IND.

“Dentistry is not bound by dogmas or individuals;
it is liberal, and anxious to reach a perfect service. It
desires the moral encouragement of every individual in
its endeavor to acquire a true and honorable basis.”

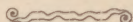
1894.



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TO THE PUPILS
OF THE
COMMON SCHOOLS OF INDIANA,

This Monograph
IS CONSIDERATELY INSCRIBED.



THE ISAAC KNAPP DENTAL C^YTERIE,
FORT WAYNE,
INDIANA.

CONTENTS.

	PAGE.
PREFATORY,.....	5
HYGIENE OF THE MOUTH,.....	7
DECIDUOUS TEETH,.....	19
SHEDDING DECIDUOUS TEETH,.....	21
CARE OF THE DECIDUOUS SET,.....	22
ANATOMY OF THE TEETH,.....	26
THE FIFTH NERVE,.....	29
CAUSES OF DENTAL CARIES (Decay).....	30
IRREGULARITY OF THE TEETH,.....	32
ODONTALGIA, OR TOOTACHE,.....	36
PULPLESS TEETH,.....	38
DISEASE OF THE ALVEOLAR PROCESS,.....	42
CROWN AND BRIDGE WORK,.....	44
THE SELECTION OF YOUR DENTIST,.....	47
DISEASES OF THE HUMAN BODY WHICH HAVE BEEN TRACED TO THE ACTION OF MOUTH BACTERIA,.....	50
A LIST OF CASES,.....	59
DENTAL FEES,.....	62
LEGAL STATUS OF DENTISTRY,.....	64

PREFAT^oRY.

IT is hoped the perusal of these pages will give much desirable information not generally known. As there are no secrets in dentistry, it is hoped, by its presentation, to establish more harmony of action between the dentist and the public. Many otherwise intelligent people are sadly deficient in dental knowledge.

The dental and medical professions are fully aware that diseased teeth are one of the causes of dyspepsia and many other diseases.

The importance of the mouth might be summed up in the language of Dr. White: "The mouth is the organ of taste, of speech, of song, of mastication and of insalivation; the avenue for the entrance of the food and drink essential to life, and the channel through which passes much of the air which is inhaled, as well as that which is expired.

"The same membrane which lines its cavity is continued throughout the nose, the

throat, the stomach and the intestinal canal; throughout the larynx, the trachea, the bronchial tubes and the lungs.

“It is thus closely related to the functions of digestion and respiration, and, by open passages with which it is abundantly supplied, with every part of the body.”



HYGIENE OF THE TEETH.

THE comfort of pure breath and wholesome saliva, the agreeable effect produced on others by the exhibition of a clean and healthy mouth, the advantages of the teeth in vocalization, the favorable impression made on the general health by the ability to thoroughly masticate the food, exemption from suffering which would be caused by diseased teeth, and the possibility of their preservation and usefulness till advanced life are reasons sufficient to induce all to pay proper attention to the health of the mouth.

The fact that teeth are liable to decay and unlike other organs are not endowed with the power to repair injury or replace lost tissue are urgent reasons why they should receive intelligent and earnest care.

The accumulation of lime (precipitated from the saliva and commonly, but erroneously, known as tartar,) about the necks of the teeth, and the retention of food in their

depressions and between their contiguous surfaces, there to undergo fermentation and decomposition, are the principal exciting causes of diseased gums, loosened teeth, and decay.

It follows, therefore, that such deposits should be removed before they work mischief. There is no question that the one great essential to a healthy mouth is cleanliness.

Only a few who pride themselves on their care of these organs give them the attention their value justifies. They fail to appreciate the importance of taking care of their teeth till compelled by suffering. Then when the demand has become imperative, their chief thought seems to be, not how best to prevent further mischief and retain as many as possible in a perfect condition, but how immediate relief from suffering can be secured, even if this means extraction.

It must not be forgotten that decay is not the only enemy of the teeth. The absorption of the gums and sockets caused by the presence of lime, is a liability which, though not confined to neglected teeth, is a threat-

ening danger. This is prevented by intelligent care; recession of the gums or absorption of the sockets rarely occur in mouths that are habitually kept pure.

Many scrupulously careful people bring about the evils which they seek to avert by improper methods. Much mischief is wrought by unsuitable brushes, and injudicious brushing; by improper tooth-powders or washes, through their chemical action on the teeth, or gums, or by containing ingredients which, deposited about the necks of the teeth, cause the absorption of the gums and alveolar processes.

Simple measures regularly employed are sufficient for healthy mouths. In diseased conditions the wash or powder to be employed should be prescribed by an intelligent dentist.

Advertised powders and washes should be avoided. Any wash that is recommended for whitening the teeth is either incapable of accomplishing what is claimed, or acts at the expense of the integrity of the enamel. The habitual use of astringent washes or powders, so far from being conducive to the

health of the gums, is injurious. For some purposes such dentifrices are of service, but their use should be discontinued as soon as the object for which they are employed has been accomplished.

Strongly alkaline washes are also injurious. Washes or powders containing alum, cream of tartar, charcoal, ground barks or acids of any description, are injurious, either because of a chemical action on the teeth, or because their insoluble ingredients are apt to be insinuated under the margins of the gums.

Tooth-powders containing gritty or abrasive ingredients, do injury by roughening instead of polishing the enamel.

Perhaps there is nothing so injurious as powdered charcoal. The harsh, insoluble particles force themselves between the gums and the teeth, creating irritation, soreness and inflammation of the tissues and inviting a deposit of lime, resulting in the absorption of the alveolar processes, and in the loosening and loss of the teeth. Its continued use, also, causes the gums to assume a tattooed appearance, like that which India ink produces when pricked into the flesh.

A mouth-wash may be anodyne, astringent, disinfectant, stimulant or tonic, but, if the secretions are natural and the gums healthy, the wash should merely be pleasant to the taste, agreeable in odor, and slightly antacid or saponaceous—not astringent.

A tooth-powder, for a healthy condition of the mouth and teeth, should be merely a mechanical agent, possessing a hardness sufficient for the removal, without liability to injure the enamel, of slight accumulation of food and lime.

It should be soluble in the fluids of the mouth and, for most persons, antacid. In mouths that are already alkaline—most likely to occur after middle life—the antacid ingredients may be advantageously omitted.

Most persons err in the selection of a tooth-brush. They are too stiff and too large. The habitual use of such brushes are injurious. Many are apt to err in a too vigorous use of the brush. Teeth have been ruined by too much or injudicious brushing. Skill and not force, faithfulness and not muscle, are required to secure the best results. Most persons scrub the outer

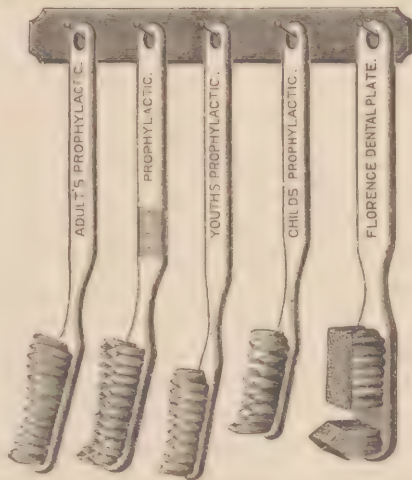
surfaces of the teeth, as if to clean by scouring or friction was the object in using a brush.

A moderate application of a proper brush, with a gentle frictional powder, is sufficient for the outer surfaces of the teeth. The surfaces of the teeth which are exposed to and protected by the movements of the tongue, lips and cheeks, do not especially need brushing, except to remove stains. But the interstices, interspaces, fissures, depressions and cavities are exposed to the deleterious action of the fermenting materials which lodge there.

It should be remembered that the removal of accumulation of food or mucus from the depressions in the bicuspids and molars, and from between the teeth is the essential.

The brush should be moderately soft, the bristles long, elastic and of uneven lengths, so that when rotated the ridges will freely pass into the spaces between the teeth. The accompanying cut represents the shape of an excellent brush for the use of children and adults, as well as one for cleansing artificial teeth.

The articulating faces of the teeth should be brushed with the same care as the other surfaces—backward and forward and from side to side over the grinding surfaces of



the molars, so as to cleanse all the depressions. Once daily is often enough to use a powder, and the best time is on retiring. During the waking hours, the movements of the tongue and muscles of the mouth, the constant secretion and the mastication of

food, all tend to prevent the chemical changes which during sleep take place without hindrance.

During the period occupied by the shedding and replacing of the temporary teeth—say from five to fifteen years of age—it is difficult to keep the teeth clean or the mouth sweet and healthy.

It is advantageous during this time, indeed at any period of life when an acid condition of the mouth is recognized, to use after the evening brushing a small quantity of precipitated chalk, rubbing it into the interstices of the teeth and allowing it to remain. The quantity need not be enough to be unpleasant; as much as would adhere to the end of a moistened finger is sufficient to counteract any acidity during the night.

The use of a quill tooth-pick after meals, to dislodge particles of food from between the teeth, is advisable, as is also the use of a strand of waxed silk floss passed between them at least once daily.

Such is the care suggested by the value of the teeth, and their increasing tendency to decay; but such care can hardly be hoped for

till the public realizes that to lose a tooth is a real misfortune, to extract one unnecessarily a crime.

A perfect denture! How few understand its significance. A set of thirty-two teeth in two unbroken arches—not one missing, not one decayed—the beau ideal of dental perfection.

But the loss of a tooth, unless it be a front one, is not considered serious by most persons, and the extent of the disaster is not appreciated, perhaps, for years afterwards.

Unquestionably, if the importance of the teeth was fully comprehended, the little attention required to keep them healthy would be cheerfully bestowed.

The injurious action of acid medicines on the teeth should be counteracted by rinsing the mouth thoroughly with either of the foregoing washes immediately after swallowing the medicine.

This immediate neutralization of the acid is much more trustworthy than the use of a tube through which the medicine is often directed to be taken, and is advisable even in addition to the use of the tube. Still

better than these is the use of capsules in which the medicine is taken, thereby allowing it to dissolve in the stomach without coming in contact with the teeth. But any medicine which will so seriously injure the teeth must be injurious to the stomach, and should be avoided if not absolutely necessary.

The peculiarly disagreeable sensation described as "teeth set on edge," from taking acid fruits, foods, drinks or medicines, is caused by the action of the acid on the enamel, perceptibly roughening its surface.

This effect is injurious, and if frequently induced cannot but prove destructive even to perfectly sound teeth, being, however, specially objectionable in teeth which have been filled, destroying the integrity of fillings by eroding the tooth-substance around margins.

More than usual care of the mouth is required during sickness. It will also be recognized that teeth need care in proportion as they are poorly organized or irregularly arranged.

The treatment of unhealthy conditions of

the mouth, as shown in a predisposition to decay of the teeth, must, to be successful, be systemic as well as local; but, fortunately, that treatment is found most effective which is also indicated for the general good of the patient.

It should include nutritious food, sunshine, sleep, change, tonics, etc., as are required alike for general and local derangements.

GENERAL QUESTIONS.

1. Why should we give attention to the health of the mouth and teeth?
2. Have the teeth any power to restore a decayed portion?
3. What effect does the accumulation of lime have on the teeth?
4. What is essential to health of the mouth and teeth?
5. Besides decay of teeth name another cause of sore gums.
6. In caring for the teeth with what may they be injured?
7. What washes and preparations are injurious?
8. Why should powdered charcoal not be used for cleansing the teeth?

9. What preparations are permissible for cleaning the teeth?
10. What is the object in brushing the teeth?
11. What kind of a brush should be used?
12. How brush the teeth?
13. Why use precipitated chalk?
14. How can the accumulations between the teeth be removed?
15. What effect do acids have on the teeth?
16. How can we counteract their effect?
17. What is denominated as a crime?
18. What conditions require special care of the teeth?

Composition of tartar:

Phosphate of lime.....	60
Carbonate of lime.....	14
Animal matter and mucus.....	16
Water and loss.....	10

Portions of enamel removed by a skillful dentist does not cause decay.



DECIDUOUS TEETH.

THESE are popularly known as temporary or milk teeth, the lower central incisors making their appearance first when the infant is about six months old, the corresponding upper ones erupting from two to three months later. Just previous to these, there are two more appearing in the lower maxillary, placed by the side of the two first erupted. These are called the lower lateral incisors. A little later the corresponding teeth of the upper maxillary appear through the gum.

At about the twentieth month the eight incisors are developed, four in each maxillary. The next teeth to be presented do not come by the side of the lateral incisors, a space is left for the cuspids, commonly known as eye teeth.

Back of the intervening space next come the first lower molars; the first upper molars at the twenty-sixth month. The coming cuspids, in the space already referred to,

only remain to complete first dentition. These may be expected between the thirtieth and thirty-second month, making a total of twenty teeth, ten in each maxilla or jaw bone.

It will be observed that the eruption of the lower set precedes the upper. The eruption of both is varied by nutrition.

That given here is from average records, being from six to thirty months, sometimes they are erupted several months earlier. As far as externally indicated, dentation here rests till the child is six years of age, when the first teeth in the permanent set are erupted.

Unlike the first teeth in the deciduous set, these do not commence with the central incisors, but with a lower molar back of the last molar erupted in the deciduous set, and about one year before the shedding of the lower central incisors of the deciduous set.

Parents who have not been instructed, generally suppose these permanent first molars belong to the deciduous set, and consequently do not regard them with the importance they deserve.

In the chapter on the eruption of the permanent set, these molars will be considered fully.

SHEDDING DECIDUOUS TEETH.

At about the age of seven years, or earlier, the shedding of the deciduous (temporary) teeth commences, the corresponding permanent teeth taking their places soon after. The process of shedding is accomplished by a mass of very vascular, soft tissue, closely applied to the roughened under surface of the temporary tooth and between it and the permanent tooth absorbing the roots and crown, until there is often but a hollow crown of enamel left. The process of shedding is not usually completed till the twelfth year, occupying about five years.

Notice the time between the shedding of lower central incisors and the upper cuspids. It is taken for granted by many that when the central incisors are shed the remaining ones immediately follow, or within about one year. This false impression lessens

their estimate of the importance of preserving them.

When they are assured the teeth are not normally shed for five years afterward they see the necessity of giving them attention.

Below is the chronology of about the time of the eruption and shedding of the deciduous or temporary teeth.

	ERUPTED.		SHED.
Lower central incisor. . .	6th	month	7th year
Upper central incisor. . .	10th	"	7½ "
Lower lateral incisor. . .	16th	"	8th "
Upper lateral incisor. . .	20th	"	8th "
Lower cuspid.	24th	"	12th "
Upper cuspid.	30-32d	"	12th "
First lower molar.	34th	"	10th "
First upper molar.	36th	"	10½ "
Second lower molar. . . .	28th	"	11th "
Second upper molar. . . .	30th	"	11½ "

CARE OF THE DECIDUOUS SET OF TEETH.

Caries (decay) of teeth seldom appears before the child is three years of age. When eruption is complete the teeth should be examined once in six months that it may be arrested.

At no age of the world has so much attention been paid to the health and interests of children as now. No care or expense should be spared to alleviate their sufferings.

The physician is promptly called in nearly all infantile disturbances. The teeth seem to be least regarded. It is our determination that in the future correct information shall not be lacking. There are nine years of a child's life, for which the teeth erupted at three years of age are provided for substantial use.

During this time bone and sinew are forming. For this purpose the masticating and digestive processes must have normal development. Defective chewing and insalivation impair digestion. The stomach can not do all. It is an immutable law of nature that every violation is followed by a penalty. Who can question the duty of preserving teeth which were intended for the period of nine years of childhood that they may perform their part in the great process of digestion and assimilation on which the mental and physical being depends?

Decayed teeth are a cause of many pale

and emaciated children! Neglect to keep in repair the deciduous teeth have brought disease through life and been the cause of premature death.

If from tenderness, the result of decay or exposed pulp (nerve), the teeth can not be used for masticating, their treatment does not necessarily involve extraction, unless within one year of their normal time for shedding, as dental skill is competent to retain them with comfort. Use at this exacting age of the child for the development of all tissues is important. They should be kept in healthful use till the permanent set occupy their places.

Then too there is not sufficient room to prevent irregularity, unless the maxillary is expanded by the retention of the deciduous set, as designed by the Creator.

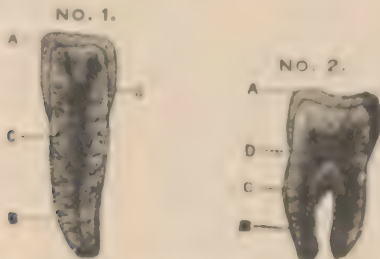
It is weak or wicked to allow your children's teeth to decay. Sometimes the the pain in the management of children's teeth is an obstacle requiring much consideration and tact on the part of both parent and dentist. Every word and act must be free from deception. Children have res-

markable discrimination; they are keenly on the alert when pain is apprehended from others. Honesty will gain their confidence and submission; deceive them once and you have forfeited all. It is a mercy that deciduous teeth are not as sensitive as permanent ones. Some are excavated and filled without pain. By making this statement and assuring the child that pain is likely to be felt in some degree; that, if severe, you will do all in your power to lessen it; and, while operating, give them occasional rest; praise their courage; inform them of the importance of bearing a little now to avoid much in the future, you prove yourself their friend and they will accept you.

Tact is used by commencing on the least painful, toning the patient up to bear increasing pain. Guard against an overtax of patience, time or courage. You will then usually be rewarded by the assurance that the pain was less than anticipated and that they are willing to return when necessary.

ANATOMY OF THE TEETH.

The figures represent (1) longitudinal sections of a superior central incisor and (2) an inferior molar, showing their various structures.



A is the cutting edge or grinding surface and designates the *enamel* which covers the entire crown.

B, the *cement* covering the roots as the enamel does the crown.

C, the *dentine* or ivory-like structure composing the greater part of the tooth.

D, the *pulp cavity*.

The exposed part of the tooth—that which is covered with enamel—is called the *crown*; that which is held within the socket and covered with cement, the *root*; and the constricted part between the crown and the root, the *neck*.

The teeth are not set in the maxillary, or jaw bone as would appear to the uninformed. The sockets in which the roots are held is a formation of spongy bone, called the *alveolar process*, and is absorbed when the teeth are extracted. This fact accounts for the change that takes place in the form of the face after teeth are extracted.

GENERAL QUESTIONS.

1. What is understood by deciduous teeth?
2. State at what age the deciduous teeth first appear?
3. Name according to their classification those first erupted?
4. Name also those last erupted to complete the first dentition?
5. At what age is deciduous dentition completed?
6. Give the number and names of deciduous teeth?
7. At what age does the shedding of the deciduous teeth commence, and when are they completed?
8. At what age should examination be made for decay, and what precautions taken?
9. State fully the physiological importance of the deciduous teeth?



THE FIFTH NERVE.

THE diagram on the opposite page shows the general distribution of the *fifth nerve* and its branches and beautifully illustrates its supply to the teeth of both upper and lower jaw.

The three large branches of the fifth nerve as shown in the figure are the *ophthalmic*, *superior maxillary* and *inferior maxillary*.

The ophthalmic, or first division of the fifth nerve supplies, the eye ball, the lachrymal gland, the mucous lining of the eye and nasal fossae, and the integument and muscles of the eyebrow, forehead and nose.

The *superior maxillary* branch supplies the *upper teeth* and gums the integument covering the temple and side of the forehead, cheek, nose and lips.

The inferior maxillary branch supplies the lower teeth, gums and tongue, the integument of the temple and external ear, the lower part of the face and lower lip and the muscles of mastication.

The intimate connection between the two last named branches of the nerve accounts in a large measure for the occasional inability to locate the seat of pain. An aching lower tooth may manifest itself in a sound upper tooth, or vice versa.

In the diagram the permanent teeth are numbered, and are named as follows:

- | | |
|----------------------|---------------------|
| 1. Central incisors. | 5. Second bicuspid. |
| 2. Lateral incisors. | 6. First molars. |
| 3. Cuspids. | 7. Second molars. |
| 4. First bicuspid. | 8. Third molars. |

CAUSES OF DENTAL CARIES.

UNTIL within the last decade the theory of decay was generally accepted as chemical; i. e. the primary or exciting cause of decay was attributed to acids generated in the mouth by the fermentation of decomposing particles of food finding lodgment between the teeth and on their roughened surfaces.

Recent discoveries, however, by our most advanced investigators, notably Prof. W. D. Miller, an American dentist, now in Berlin, warrants the conclusion that micro-organisms (bacterial) are the origin of all decay in the teeth, indeed of all affections of the mouth, excepting irregularities of the teeth, that the dentist is called on to treat; or at least these are generated in decay and cause its increase.

The mouth forms a warm bath, and all favorable conditions for the development of microbes. They lodge upon all surfaces of the teeth not smooth and sound and by their corroding products cause decay. The cause

of some teeth decaying more rapidly than others is from difference in the tooth structure, the lime base of the tooth being of variable density. Added to this is neglect to keep the mouth pure. Sickness, medicine, the use of improper tooth-powders and washes, all vitiate the secretions (fluids) of the mouth, favoring the multiplicity of these microscopic germs which invade the cavity, augmenting vastly the process of decay.

GENERAL QUESTIONS.

1. What was formerly thought to be the cause of decay of the teeth?
2. What is now considered to be the cause of dental caries?
3. What condition of the mouth favors the development of microbes?

Composition of saliva:

Water.....	992.9.
Ptyalin.....	2.9
Mucus.....	1.4
Extract of flesh with alkaline lactates	.9
Chloride of sodium.....	1.7
Soda.....	.2

If particles of food are allowed to remain between the teeth, decomposition, fermentation and putrefaction are sure to produce caries.

IRREGULARITY OF THE TEETH.

THIS is an abnormal condition of the arch, in which teeth deviate from that easy, graceful curve by which we distinguish the highest order of physical development. Yet, of course, arches are not of the same size or curve. They differ in type and are varied according to nationality and race, and by the inter-marriage of races. Sharp or acute angles are usually deformities.

ETIOLOGY OR CAUSES.

The causes of irregularity are quite as varied as irregularities. Among these causes are: Premature loss of temporary teeth; the effect of nervous disturbances; thumb-sucking; mechanical injuries, &c., and notably when one parent has a large dental arch and corresponding large teeth, while the other parent has a small arch and teeth to correspond. The offspring of this parentage is likely to inherit the smaller arch and the larger teeth, resulting in overcrowding and irregularity.

OVER-RETENTION OF THE TEMPORARY TEETH.

Is one of the most frequent causes of the permanent teeth assuming a zigzag or irregular position in the arch.

As a rule, the temporary teeth should loosen and drop out, or become so that they may be easily removed with a thread; but this is not always so. Nature needs assistance many times, and especially if her activities have been interfered with.

NERVOUS DISTURBANCES.

Nervous disturbance is a frequent cause of irregularity. We are rapidly becoming a nation of nervous temperament, at a sacrifice of physical development. In the older times the physique received the most attention; to-day, the brain. The result is crowded dentures and deformity of the features through the defective growth of the jaws during the eruption of the permanent teeth. The jaws and teeth should develop together harmoniously, but this cannot be if hygienic diet and exercise are disregarded, and the development of the bones

and muscles are sacrificed for precocious intellectual ascendancy.

HEREDITARY TRANSMISSION OF IRREGULARITIES.

such as narrow and V shaped arches, to offspring is frequent. Correct articulation (contact of the upper and lower teeth) is necessary for the proper mastication of the food. The correct mechanism of speech depends largely on the regularity of teeth and shape of the arch, and just here modern dental science steps in with skill, able to correct almost any irregularity or deformity in or about the mouth.

Parents, if you have a child with irregular teeth or deformed mouth, take the same pains to have your dentist correct it, as you would call upon your physician and surgeon, or send your child to some surgical institute, if afflicted with any other bodily deformity.

GENERAL QUESTIONS.

1. What is meant by irregular teeth and arch?
2. Name some of the causes of irregularity of the teeth?
3. What is one of the most frequent causes?

-
4. May irregularity of the teeth be inherited?
 5. Does the loss of teeth affect speech? Do you know of an instance of that kind?
-

Materials for the permanent filling of teeth are confined to two, gold and alloy. Oxiphosphate, or white filling, is not reliable as a permanent filling, though in exceptional cases it has lasted for several years. It is often best for children's teeth. Gutta percha serves only a temporary purpose; except that sometimes a large cavity or hypersensitive tooth is better filled with gutta percha or oxiphosphate and finished with gold or alloy.

Science teaches us that the best proportions for the common wants of the animal system are, about nine of fat, twenty-two of flesh-forming substances and sixty-nine of starch and sugar.

Sugar in itself is powerless to act on the teeth, and not till it is changed to an acid will it affect them.

Enamel, dentine and cementum are the divisions of the bony structure of the teeth.

ODONTALGIA, OR TOOTHACHE.

ODONTALGIA or toothache is a pain generally resulting from an exposed pulp (nerve.) This exposure causes irritation, this causes inflammation, congestion, and enlargement. Then this enlarged pulp, pressing on the unyielding walls of the pulp chamber causes agonizing pain. By reflex action, the pain may seem to be transferred to a sound tooth.

Toothache arises chiefly from two conditions of the pulp: First, a living, exposed and inflamed pulp; second, a dead and decomposed pulp, producing pus, or by this pus producing an abscess.

The first condition is recognized when heat and cold or other irritants enter the cavity of decay. An ache from this condition may be relieved by freeing it from all foreign substances and after proper treatment protecting it from further external influences.

The second condition is of a different character and calls for different treatment.

This results from the death of a pulp long exposed, which decomposes and inflames the membrane surrounding the root and is characterized by a sense of elongation when the teeth are closed. This may be relieved by a counter-irritant applied to the gum opposite the root of the tooth. Removing all that clogs the cavity and penetrating the extremity of the root with a needle will relieve the gas or pus. But often this will terminate in an abscess. The live exposed pulp will have acute lancinating pains; the other deep-seated throbbing pains with swelling.

GENERAL QUESTIONS.

1. What is toothache and what is its technical name?
2. How is it a pain may be felt in a sound tooth instead of the one in trouble, and what is this pain called?
3. What two conditions may cause toothache?
4. How do we distinguish these two conditions?
5. What treatment is indicated in each?

The teeth, generally, are the least understood, the most neglected and least considered of all the various organs of the body.

PULPLESS TEETH.

PULPLESS teeth are those in which the pulp is destroyed. In common parlance they are spoken of as dead teeth.

It is this condition that often causes a dull pain, swelling of adjacent parts and alveolar abscesses (gum-boils.) The irritant causing this inflammation and death, with rare exception, is caries of the tooth encroaching on the pulp, and consequent exposure, unprotected from external influences.

The dead pulp becomes foreign matter, and in turn becomes itself an irritant to tissue in contact with it. Remaining there in a putrefactive state, its effect is the same as if imbedded in any other part of the body.

This is the answer to the question so often asked: "Why does the tooth ache when the nerve is dead? When the debris of the pulpless tooth is removed and the tooth filled with a non-irritating and durable material with treatment known to modern den-

tistry, the tooth is restored to its important mission.

It is often incorrect to speak of a tooth in which the pulp is removed as dead, the pulp being only one of two sources of its vitality; the membrane covering the root within the socket, called the pericementum, being the other.

From the latter, sufficient vitality is derived to retain the root. Even if the crown is broken down, the root may be relied on to support an artificial tooth. Therefore, the extraction of such roots should be condemned.

Thus the remedies frequently used in a popular way for toothache do not provide for different conditions. In cases of pain from pulpless teeth, stopping the cavity would confine the gas, attendant on the decomposition going on within, and increase instead of diminish the trouble, by forcing the gas through the apex into the socket; while the exposure of a living pulp calls for a covering of some non-irritating substance to protect it.

In alveolar abscess, swelling of the parts

always precedes the discharge of pus. Placing poultices on the face is forbidden, as it favors a discharge externally, leaving a scar.

This discharge must only be encouraged on the gum, in close proximity to the affected tooth, if it can not be entirely prevented by removing the cause.

For this, the only home treatment suggested, is to place a roasted fig, as warm as can be borne, on the gum in close proximity to the root of the affected tooth, protecting the cheek with a patch of linen, or what would be better a piece of rubber cloth. A pepper plaster is also good.

GENERAL QUESTIONS.

1. What is understood by pulpless teeth?
2. What are the irritants that may destroy the life of a pulp?
3. What causes strangulation of the pulp?
4. What condition of the pulp causes irritation?
5. How may we restore the tooth to its normal condition?
6. How many sources of vitality has a tooth?
7. Name them.

8. What use can be made of the roots of broken-down teeth?

9. Why are poultices forbidden on the outside of the face in alveolar abscess?

10. What home treatment is suggested?

Avoid the dentist who advertises, or claims to have superior advantages over his fellow practitioners, or offers his services at a small fee. It is conclusive evidence of inferiority. If dental work is only mechanical it is worth but little. If it is the result of extensive scientific and professional research and skill it is worth much.

Chalk, lime-water or a solution of common soda are the only preparations permissible without the sanction of a dental advisor. These are recommended when teeth are over-sensitive and for acid conditions of the mouth. Their use is better before retiring at night.

Acids do not act alike on the teeth. The degree of destruction does not depend alone upon the kind of acid, but upon the quality or density of the tooth substance.

DISEASE OF THE ALVEOLAR PROCESS.

OFTEN disease of the alveolar process results seriously. Sections of bone, varying in size from the socket of a tooth to that including the sockets of several teeth, or even a greater part, or the whole of the maxillary, have been destroyed by disease.

The causes may be classified as diseased teeth, mechanical violence, syphilitic and mercurial poisoning. Whatever the cause, there are first changes in the health of the affected tissue corresponding to a complete history of inflammation. The maxillary, like all other bones of the body, is covered by a delicate membrane, the periosteum, from which it receives considerable of its nourishment.

Long continued disease of the periosteum may result in necrosis or dead bone. The time necessary to accomplish necrosis depends on the general health of the individual and the severity and nature of the disease.

Caries may continue till the pulp is encroached on, and the pulp dies. If the pulp decomposes within its cavity, gas and foul matter will be generated, which, not finding a free escape from the pulp chamber, irritates the delicate membrane surrounding the root, and may cause ulceration, which is quite different from an abscess. It spreads, and destroys every tissue it touches.

If the irritation be long continued, there will be an absorption of the sides of the root (it is seldom from the apex of the root) and of the adjoining bone. The pus formed is extremely acrid. The pus or rather the acrid liquid, which is dissolved or broken down pus, may escape between the root and the surrounding tissue eating everything in its course.

Mechanical violence—the force of a blow or fall may result in an inflammation, and death of a portion of the maxillary and its membrane.

Mercurial poisoning—excessive mercurial treatment tends to disastrous consequences on the tissue of the mouth.

Syphilis is extremely destructive.

CROWN AND BRIDGE WORK.

AT no time in the history of dentistry have there been so many and varied substitutes for natural teeth, from which to choose, as at present.

Those who have had the misfortune to be deprived of their teeth, have met with an irreparable loss. Sets of teeth depending on a suction-plate, or on adaptation to the mouth, are greatly beneficial, but usually these fall short of perfection. Within the last decade invention has brought out what is known as bridge-work, which is applicable only where two or more firm roots or teeth remain in the mouth, and consists of anchorage being made to these, giving firmness to the structure without a plate to cover any considerable portion of the mouth.

Full or partial sets can be retained in the mouth depending wholly on roots, or a few remaining teeth. Of all forms of substitutes yet devised, bridge-work, when made with skill and good judgment, is the most valuable.

It gives the patient comfort, and does away with cumbersome and unsatisfactory plates.

Associated with the invention of bridge-work, is crowns on broken down teeth or roots.

These are constructed of all gold, or of porcelain, or of gold, platinum and porcelain combined. Since crown and bridge-work have advanced, the treatment of diseased roots and teeth can not be over-estimated.

It is astonishing to see how many roots and broken-down teeth that are considered worthless, can thus be made the supports for good comfortable teeth—teeth looking so natural it is impossible for a casual observer to detect them as artificial, and so useful and easy to the wearer that he soon forgets to distinguish them from the others.

GENERAL QUESTIONS.

1. What substitutes are offered for the natural teeth?
2. How many roots of teeth are necessary where bridge-work is to be used?

3. What is said of the value of bridge-work as compared to other substitutes?

4. Of what kinds of material are crowns constructed?

5. What value is placed on the treatment of diseased roots for crown and bridge-work?

Gestation is sometimes attended with an impoverishment of the mineral supply to the teeth, their resistant strength is consequently lessened against attacks of decay. During such periods special care in cleanliness must be observed to guard against such attacks. The osseous system can also be fortified, constitutionally, by the administration of some forms of lime.

In cleaning the teeth, the points requiring most attention are in the depressions, at the margin of the gums and especially between the teeth. If, in passing a waxed silk thread between the teeth, it is cut or torn, decay may be suspected.

In 1820 there were only one hundred dentists in the United States. Now, in 1894, there are nearly 20,000.

SELECTION OF YOUR DENTIST.

THE question, whom shall I employ to attend to my teeth? can be decided by a little reasoning, the same you would use in seeking the services of a minister, physician, lawyer, artist or mechanic.

There is a large range of ability and skill among dentists; all of their work bears evidence of individuality. It must be evident to the thoughtful and observant that dentistry is a combination of art and science. There are many dentists who never rise above operations requiring the least skill.

Their practice consists chiefly in the extraction of teeth, making artificial sets and filling such natural teeth as require but little treatment and skill. While the really competent dentist includes many mechanical features in his practice, he lays the greatest stress on the treatment and saving of the natural teeth or their roots, and treatment of gums and associate parts. He is, indeed, an oral physician and surgeon.

It is evident he cannot be proficient and

keep pace with the great advances in these, without constant study and conference with those investigators who are making dentistry one of the most learned of our professions. Its reputable practice involves great care, esthetic taste, a high order of ingenuity, and physical and mental training.

A good dentist has no occasion to advertise special modes of operating, exclusive advantages, etc. And when one advertises beyond the word "DENTIST," he is to be avoided. His special advertising is only to attract the credulous, and is an indication that his skill is of such a low order that he cannot depend upon his labor to bear fruits. Skill is indicated by the price. Those of ability and skill in other profession never try to win patronage by the tricks of the charlatan.

Seek only those who are known to be honest in all their dealings, who are known to be members and *regular attendants* at some dental society, by which they can compare notes and adopt methods found good.

You would not employ any other professional man who did not associate with his

fellows for mutual improvement. It is only by associated effort the best is obtained. This is demonstrated in all other departments of human endeavor, and the dentist who ignores it aims only to practice in the most superficial way and depends on gaining popularity by advertising some attractions or through mediums other than devotion to his practice.

Dental laws are for the people, not for the profession.



DISEASES OF THE HUMAN BODY

Which Have Been Traced to the Action
of Mouth-Bacteria.

BY W. H. MILLER, M. D., PH. D., BERLIN.

[Extracts from the paper.]

1. DECAY OF THE TEETH.

Decay of the teeth must be set down as the most wide-spread of all parasitic disease to which the human body is subject, if we take into consideration the results which follow a case of general decay, particularly in the mouth of young or weak persons, it often becomes a disease of very grave nature.

The havoc wrought by dental caries in the mouths of vast numbers of children, or even adults, among the lower classes, is a much more serious thing than an attack of chicken-pox, or measles.

2. PULPITIS, GANGRENE OF THE PULP, PERIO- DONTITIS.

Inflammation of the dental pulp, with the exception of the comparatively few cases where it is the result of trauma or of calcareous formations in the pulp-chamber, erosion, etc., is due directly or indirectly to

parasitic influences, while gangrene of the pulp can never have any other origin under any circumstances.

Pericementitis apicalis, the form of pericementitis which is most severe and gives rise to the most serious consequences, is likewise of parasitic origin, being produced by germs or their products, or by both together passing from the root-canal through the apical foramen.

3. ALVEOLAR ABSCESS.

Alveolar abscess is an infectious disease, primarily of a local character, but frequently, or usually, accompanied by general symptoms of varying intensity, and sometimes attended by complications of a most serious nature.

Severe cases of alveolar abscess, particularly in weak persons, not unfrequently present symptoms of an alarming nature.
* * * I wish to call particular attention to the many cases in which it has terminated fatally through the supervention of septicæmia or pyæmia.

It must be constantly borne in mind that wherever micro-organisms are accumulated in large masses in any part of the body, the possibility of their being carried to other parts through the blood or lymph-channels, and of their producing, accordingly, metastatic abscesses where a point of diminished

resistance exists, can never with certainty be excluded.

* * * In like manner, general blood-poisoning (septicaemia), with speedily fatal termination, has been seen to result from accumulation of infectious material about the roots of a tooth. Cases will be found in the table.

4. OTITIS, OSTEOMYELITIS.

Every severe inflammation of the pericementum is naturally accompanied by more or less inflammation of the bone-marrow, or of the bone (ostitis), or both together (osteomyelitis.)

Severe cases of osteomyelitis, fortunately of comparatively rare occurrence, are of exceedingly doubtful prognosis. Schede reports nine cases, of which all but one ended fatally, death resulting from acute or chronic sepsis, or from a spreading of the infection through the floor of the mouth and retrotonsillar tissue into the mediastinum, producing pleuritis, pericarditis, etc., with purulent exudations.

In the table many cases of osteomyelitis resulting from diseased conditions of the teeth or from operations upon them will be found.

It is worthy of remark that these cases occurred, almost without exceptions, in the lower jaw.

5. PERIOSTITIS AND NECROSIS.

A slight inflammation of the periosteum of the alveolar process and a slight necrosis of the bone necessarily accompany all abscesses in which the pus makes its way to the surface of the bone.

Not unfrequently, however, periosteal inflammation resulting from caries are of an exceedingly violent character; intense, continuous pain, often lasting for days; enormous swelling, debility, fever, chills, sometimes terminating fatally.

Necrosis is but a more advanced stage of osteomyelitis and periostitis. The bone, deprived of all sources of nutrition, dies (becomes necrotic), and is afterward thrown off by the surrounding tissue in form of a so-called sequestrum.

6. DENTAL FISTULÆ.

In this connection I refer in particular to those fistulæ of dental origin which open on the neck, shoulder, arm, or breast, thus giving rise to so-called "running sores," which of course defy all treatment until the true source is discovered.

7. SEPTICÆMIA.

Many cases can be found in medical and dental literature in which a general infection of the blood, causing the death of the patient in a few hours, has resulted from the

accumulation of pus about a diseased tooth or from operations in the mouth.

8. PYÆMIA.

Chronic pyæmia presents itself in the form of abscesses of varying intensity occurring in different parts of the body, healing spontaneously at one point, only to break out again at some other more or less remote. An abscess at the point of the finger or on the toe may originate in a diseased tooth as well as an abscess at the point of the root.

The focus of infection maintained by the diseased tooth constantly gives up its virus to the blood or lymph by which it circulates through the system, and, under favorable conditions, establishes itself at any point where, at the time, there may be diminished vitality.

9. IMPERFECT ERUPTION OF WISDOM TEETH.

The chronic state of irritation upon the gums and periosteum resulting from impacted wisdom-teeth, makes it possible for micro-organisms, which obtain entrance between the crown of the tooth and the overlapping gums (assisted as they so frequently are by the irritating action of small particles of food undergoing fermentation), to multiply in large numbers and, penetrating along the course of the distal root into the depth of the jaw to bring about the series of dis-

turbances, osteitis, osteomyelitis, periostitis, phlegmon, trismus, and in some cases necrosis or even septicæmia. (Cases, 117-120.)

10. PYORRHEA ALVEOLARIS.

There may be many reasons for believing that pyorrhea alveolaris has an origin similar to that of the suppurative process associated with the impeded eruption of the lower wisdom-teeth.

The evil results of allowing this disease to gain the upper hand manifest themselves not only in the impairing or complete loss of the efficiency of the teeth as organs of mastication; but alas, as has been expressed by Galippe when a secretion of matter in the mouth becomes general, patients may suffer from fever, loss of appetite, stiffness, severe disturbances of the alimentary canal, insomnia, discoloration of the skin, etc.

11. DISTURBANCES IN THE ALIMENTARY TRACT.

The mouth, as has been sufficiently well established, furnishes one of the chief sources for the constant recruiting of the bacteria of the stomach and intestines. Not only this, but the constant swallowing of decomposing matter and of pus from an improperly cared for mouth may lead to the most serious disturbances, both acute and chronic.

We have known patients under treatment for troubles of the digestive tract to most scrupulously sterilize all articles of diet and then pass them through a mouth seldom visited by a tooth-brush, thereby incorporating with them millions of bacteria.

In all troubles of the digestive tract, too much care cannot be bestowed upon the antisepsis of the mouth.

12. THE INFECTIONS ANGINE, TONSILLITIS, ETC.

It is now commonly recognized that the tonsils may harbor various pathogenic bacteria in their lacunae without any appreciable evil consequences, until, through some cause or other, which may be of a very trivial nature, their action manifests either in form of a local or general infection. Particularly tonsils which are chronically inflamed, hypertrophied, are dangerous accumulators of pathogenic germs.

13. INFILTRATION OF THE SURROUNDING TISSUE AND CHRONIC SWELLING OF THE LYMPHATIC GLANDS IN THE REGION OF THE LOWER JAW AND NECK.

The casual relation of a diseased condition of teeth to this affection has been clearly enough established by Odenthal, who found glandular swelling in ninety-nine per cent. of all children who suffered from decayed teeth, and only in forty-nine per cent. of those with sound teeth.

14. DISEASES OF THE MAXILLARY SINUS

are of such frequent occurrence that every practitioner must have seen one or more cases. It is not necessary to refer to the fact that they are, in the vast majority of cases, the result of the action of mouth-bacteria. Complications of these troubles which require particular mention are diseases of the nasal cavity, chronic catarrh of the frontal sinuses with constant flow of offensive mucus, spreading of the affection to the orbit and hence to the brain, or through the cribriform plate of the ethmoid to the brain, meningitis.

15. DISTURBANCES RESULTING FROM THE ABSORPTION OF THE PRODUCTS OF PUTREFACTION THROUGH THE MUCOUS MEMBRANE OF THE MOUTH.

In persons of uncleanly habits, who neglect the care of the mouth, and especially who allow rubber plates to remain in the oral cavity for weeks together, constantly covered with a thick coating of putrefying mucus and food, loss of appetite, nausea, vomiting and chronic indigestion may result from the prolonged action of the products of decomposition upon the mucous membrane of the mouth and pharynx.

16. STOMATITIS ULCEROSA.

There can be no doubt that the intense suppurative and putrefactive processes often

appearing in advanced stages of these diseases are not the result of the action of the mercury or of the general condition known as scorbutus, these serving only to deprive the tissue of its normal power of resistance and so to prepare it for the invasion of the ever-present bacteria.

The same is to a certain extent of stomatitis diphtheritica, which seldom attacks the normal healthy mucous membrane of the mouth, as well as of the stomatitis syphilitica, frequently met with in old cases of latent or "cured" syphilis.

17. DIPHTHERIA.

The fact that an attack of diphtheria may be provoked by slight wounds in the mouth, or by the presence of diseased teeth, and the fact that the extirpation of the tonsils has proved to be one of the most successful prophylactic measures against diphtheria, seem to point to the conclusion that the human mouth and throat harbor the diphtheritic bacilli under normal conditions until the proper moment arrives for them to assert their specific action.

18. TUBERCULOSIS.

Many cases are on record in which primary tuberculosis of the mouth has made its first appearance around diseased teeth or roots of teeth.

A LIST OF CASES

In which severe complications resulted from diseased teeth or from operations in the mouth. The cases furnished by Dr. Delleville were all observed in the Allgemeines Krankenhaus, Hamburg.

No.	REPORTER.	PATIENT.	CAUSE.	COURSE OF DISEASE.	RESULT.	REMARKS.
1	DR. DELLEVILLE.	Man, a. 48. healthy.	Diseas'd lower incisors.	Abscess, osteomyelitis, necrosis, laryngitis.	Death.	
2	BAXTER, Dental Cosmos, 1879, p. 500.	Child, a. 3.	Sucking the father's tooth-brush.		Syphilis.	
3	Private Communication	Dentist.	Wound in finger with dental instrument.	Chron. pyæmia-abscesses and phlegmons on all parts of the body.		In the course of 2 yrs. no less than 135 abscesses formed.
4	DR. DELLEVILLE.	Driver. Age 36.	Extr. of roots in inf. max.	Abscess of cheek, periodontitis, osteomyelitis mandib.	Disch'rg'd after 6 mos.	Treatment: incision, sequestrotomy.
5	PIETRZIKOWSKI, Oesterreich. Viertel-jahrschrift für Zahn- und Mundheilkunde 1886, S. 365.	Shoemaker's wife, a. 26.	Alveolar abscess, i. i. m.	Osteomyelitis, necrosis of articular process of the right lower jaw.		Treatment: sequestrotomy incision, sublimate irrigation.
6	BURDET, Ohio State Journal of Dental Science, 1886, p. 331.		Attempted extr.	Swelling, œdema of face, abscess of orbit.	Blindness.	
7	DR. DELLEVILLE.	Boy. Age 5.	"	Swelling of right lower jaw, abscess, periodontitis.	Dis. after 5½ mos.	Treatment: incision.

LIST OF CASES—CONTINUED.

No.	Description.	Patient.	Cause.	Onset of Disease.	History.	Remarks.
8	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
9	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
10	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
11	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
12	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
13	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
14	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
15	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
16	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
17	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.
18	The Disease.	Woman, Age 45.	Asthma.	Dyspnoea, chest pain.	Onset of disease.	Treatment: none.

LIST OF CASES—CONTINUED.

15	WHITE.	Boy, age 7.	Alveolar abscess, Necrosis.	Loss of of ramus l. s.
16	MARVIN.	Gentleman	Abscess of r. i. Extensive sloughing, septicaemia, m. after filling tineaemia.	Death.
17	DR. DELLEVIE.	Workman, Age 45.	Extr. 3 molars, 1 in upper, 2 in lower jaw.	Dis. after 5 weeks.
18	DECHAUX.	Ten Workmen.	Use of gas blower's pipe.	Syphilis.
19	DR. DELLEVIE.	Boots, Age 28.	Extraction of r. i. 3 m.	Dis. after 7 weeks.
20	DR. DELLEVIE.	Boy, age 7.	Caries of lower molars.	Death.
21	HOWSE, Med. and Gazette, 1876.	Child, Age 4½.	Carious teeth in inf. max.	Sup. in inf. dent. canal. Death after 9 days.
22	COOPMAN, Cor., Ill. f. Zahnarte, '89, S. 56.	Boy, age 8.	Absc. r. i. l. m.	Periostitis, septicaemia, metastatic abscesses.
23	MARSHALL, Den. Cos. Dec. 1888, p. 891.		Absc. of lower wisdom-tooth.	Sup. swelling, necrosis, gangrene, sepsis.

Ex. of tooth failed to arrest the disease.

Death after 5 days.

Death after 12 days.

DENTAL FEES.

AN impression prevails among a certain class of patients that the fees of some dentists are exorbitant. This false impression is due to a comparison of the *PROFESSIONAL* DENTIST, who treats therapeutically and surgically all conditions of diseased teeth and roots of teeth, as well as other diseases of the mouth, with the mechanical dentist who does not aim at this class of work, but is satisfied with filling simple cavities and unnecessarily extracting these teeth more extensively decayed and substituting for them artificial ones.

The disparity in skill, mental and physical labor, and the greater benefits that follow the former, plainly indicate that the mechanical dentist is not entitled to equal remuneration.

The expense attending the length of time for the professional dentist to acquire skill, and his materials, accessories and assistants, is far more than appreciated by the public.

Still, all of these do not constitute the

real basis of his fees, but little more than would the general physician take the same into consideration, when estimating his services; *it is his skill*. It is the skill and achievements of the dental physician, competent to treat and restore to health (save) human teeth, which commands fees, not his materials or drugs; therefore, it is his *time* and the results of his skill he values.

“ To save a mortal from the grave,
A limb from amputation ;
Preserve the visage from a cave,
With healthy mastication ;
Are blessings that the race desire,
In filling life's true mission,
And he is worthy of his hire,
Who acts the true physician.”

TO PREPARE LIME WATER.—Into a pint bottle previously filled with fresh rain or distilled water, place a piece of unslacked lime the size of an English walnut, shake and allow to stand two or three hours, use from the bottle, or pour off. A deposit indicates full strength.

The above direction, only substituting the same quantity of English bi-carbonate of soda in place of the unslacked lime, makes a solution of bi-carbonate of soda.

After teeth are fully formed they do not materially change their structure.

LEGAL STATUS OF DENTISTRY.

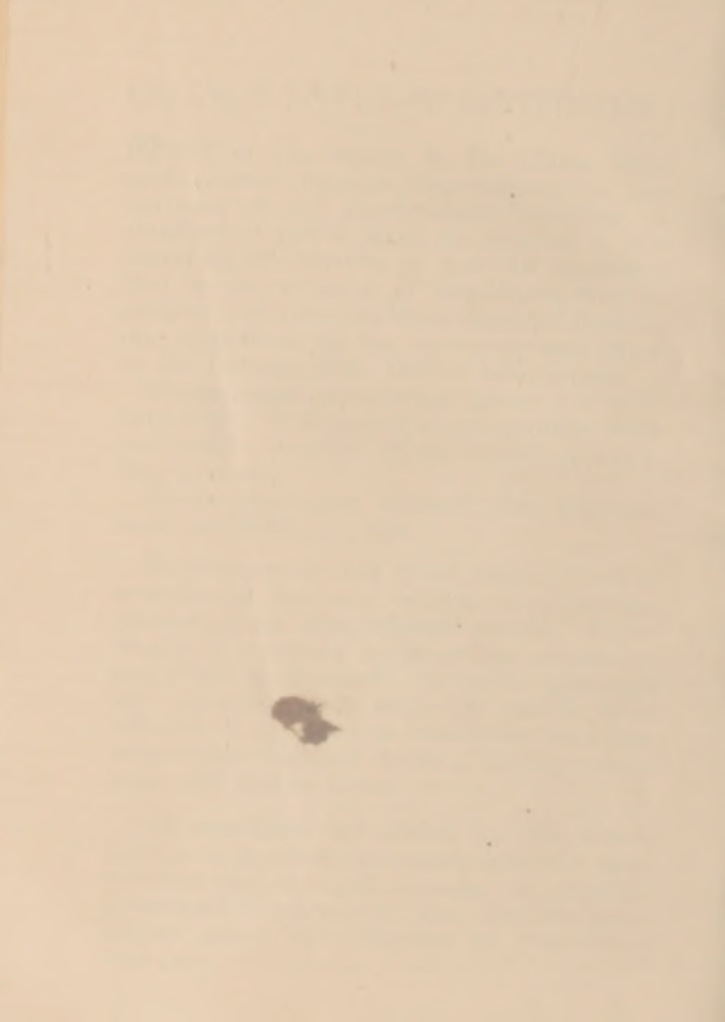
MOST of the States in the Union have dental laws. Indiana, appreciating the importance of its practitioners reaching a standard of qualification has enacted a law requiring all dentists to pass an examination before a board of examiners, five in number, one from the State Board of Health, one appointed by the Governor and three by the Indiana State Dental Association.

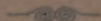
Those found qualified are given a certificate which is required to be recorded with the county recorder of the county in which they practice.

Those practicing without this endorsement are liable to a fine.

Receding gums and loose teeth, if not a new disease but only of late years become classed as an independent disease. Technically it is known as *pyorrhea alveolaris*, and if left to its course, the teeth, although not decayed, fall out. A mouth thus affected is in a worse condition than one with badly decayed teeth. Timely treatment will restore them.

All assertions and claims for the possibilities of dentistry are based upon the supposition that the work is done by skillful, conscientious operators; also, that the beneficiary gives full attention to cleanliness and care.





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